Wave Particle Duality

1. Which phenomenon can only be explained by assuming that light is quantized?
   1) polarization
   2) diffraction
   3) interference
   4) photoelectric effect

2. Interference and diffraction can be explained by
   1) the wave theory, only
   2) the particle theory, only
   3) neither the wave nor particle theory
   4) both wave and particle theory

3. Wave-particle duality is most apparent in analyzing the motion of
   1) a baseball
   2) a space shuttle
   3) a galaxy
   4) an electron

4. Which phenomenon best supports the theory that matter has a wave nature?
   1) electron momentum
   2) electron diffraction
   3) photon momentum
   4) photon diffraction

5. Which phenomenon is most easily explained by the particle theory of light?
   1) photoelectric effect
   2) constructive interference
   3) polarization
   4) diffraction

6. Experiments performed with light indicate that light exhibits
   1) particle properties, only
   2) wave properties, only
   3) both particle and wave properties
   4) neither particle nor wave properties

7. Which phenomenon is best explained by the particle nature of light?
   1) interference
   2) the Doppler effect
   3) polarization
   4) the photoelectric effect

8. Which phenomenon can be explained by both the particle model and wave model?
   1) reflection
   2) polarization
   3) diffraction
   4) interference

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Answer Key
Merged 2004-2006 [May 11, 2012]

1. 4
2. 1
3. 4
4. 2
5. 1
6. 3
7. 4
8. 1